GENERAL NOTES

1 GENERAL SPECIFICATIONS: ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE 1984 STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION OF THE DEPARTMENT OF TRANSPORTATION, STATE OF WASHINGTON, APPLICABLE TO THE PROJECT.

2 DESIGN SPECIFICATIONS: IN ACCORDANCE WITH THE CURRENT EDITION OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1977 EDITION WITH 1978 THROUGH 1981 INTERIMS, EXCEPT AS SUPPLEMENTED OR AMENDED BY THE PLANS, SUPPLEMENTAL SPECIFICATIONS AND/OR SPECIAL PROVISIONS.

3 DESIGN LOADINGS:

3-1 PERMANENT LOADS

3-1-1 DEAD LOAD CONCRETE - FOR THE STRUCTURAL CONCRETE A DENSITY OF 155 LBS/CU FT HAS BEEN USED FOR THE SUPERSTRUCTURE. 160 LBS/CU FT HAS BEEN USED FOR ALL OTHER CONCRETE. THESE DENSITIES INCLUDE ALL THE WEIGHT OF REINFORCING STEEL, PRESTRESSING STEEL, AND EMBEDDED ITEMS.

3-1-2 SUPERIMPOSED DEAD LOAD - (INCLUDES UTILITIES, OVERLAY, AND BARRIERS).
(A) LINE LM: 2.3 KIPS/LF
(B) LINE LL: 2.4 KIPS/LF

3-2 LIVE LOADS

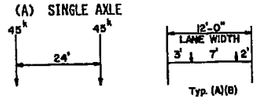
3-2-1 LINE LL - THESE STRUCTURES ARE DESIGNED FOR HS20-44 LIVE LOAD, AS SPECIFIED IN AASHTO SPECIFICATIONS OR ALTERNATE LOADING OF TWO 24-KIP AXLES SPACED FOUR FEET APART, WHICHEVER PRODUCES THE GREATER STRESSES.

3-2-2 LINE LM - THESE STRUCTURES ARE DESIGNED FOR THE RAPID TRANSIT LOADING, PER THE PUGET SOUND GOVERNMENTAL CONFERENCE, IN ADDITION TO THE REQUIREMENTS USED ON LINE LL.

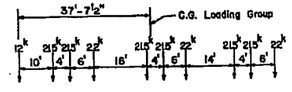
3-2-3 OVERLOADS - THESE STRUCTURES ARE DESIGNED FOR THE FOLLOWING OVERLOAD CONFIGURATIONS. THESE OVERLOAD CONDITIONS ARE APPLICABLE TO BOTH THE LONGITUDINAL AND TRANSVERSE GIRDER DESIGN. IT IS ASSUMED THAT THESE OVERLOADS OCCUPY A STANDARD DESIGN LANE AND INCLUDE IMPACT. IN THE APPLICATION OF THESE OVERLOADS, LOAD ONE DESIGN LANE ONLY WITH THE OVERLOAD AND LOAD THE REMAINING DESIGN LANES AS APPROPRIATE WITH AASHTO LOADS.

OVERLOAD CONFIGURATIONS

(A) SINGLE AXLE




(B) BL-2




3-3 TEMPERATURE

3-3-1 TEMPERATURE RISE 45°F
TEMPERATURE FALL 45°F
FROM A NORMAL TEMPERATURE OF 64°F

3-3-2 DIFFERENTIAL TEMPERATURE BETWEEN TOP AND BOTTOM SLAB. IT HAS BEEN ASSUMED THAT THE TOP SLAB WILL BE WARMER THAN THE BOTTOM SLAB WITH A LINEAR VARIATION BETWEEN THEM IN THE FOLLOWING COMBINATIONS:
(A) DEAD LOAD + PRESTRESS + 18°F
(B) DEAD LOAD + PRESTRESS + LIVE LOAD + 9°F

3-3-3 DIFFERENTIAL TEMPERATURE IN TOP SLAB. A 15°F LINEAR THERMAL GRADIENT WITHIN THE TOP SLAB WAS ALSO COMBINED WITH DEAD LOAD.

3-4 WIND LOAD - IN ACCORDANCE WITH AASHTO.

3-5 EARTHQUAKE - PROVISIONS FOR EARTHQUAKE FORCES HAVE BEEN MADE IN ACCORDANCE WITH THE LATEST FEDERAL HIGHWAY ADMINISTRATION REPORT ON "SEISMIC GUIDELINES FOR HIGHWAY BRIDGES" BY THE APPLIED TECHNOLOGY COUNCIL (ATC-6).

3-6 CREEP AND SHRINKAGE - CREEP AND SHRINKAGE HAVE BEEN APPLIED IN ACCORDANCE WITH THE CEB-FIP MODEL CODE FOR CONCRETE STRUCTURES, (CEB-FIP-COMITE EURO-INTERNATIONAL DU BETON-FEDERATION INTERNATIONAL DE LA PRECONTRAINTE - 3RD EDITION, 1978). THE FORCES INDUCED BY CREEP AND SHRINKAGE HAVE BEEN ACCOUNTED FOR IN THE SUPERSTRUCTURE AND, WHERE APPROPRIATE, IN THE SUBSTRUCTURE.

3-7 ERECTION LOADS - LOADS IMPOSED ON THE BRIDGE STRUCTURE DURING ITS PHASES OF ERECTION HAVE BEEN TAKEN INTO ACCOUNT. THE ENVISIONED ERECTION SYSTEM IS BY CAST-IN-PLACE BALANCED CANTILEVER AND CAST-IN-PLACE ON FALSEWORK AS ILLUSTRATED ON THE ERECTION SCHEME DRAWINGS. THE ASSUMED ERECTION EQUIPMENT LOADS ARE GIVEN ON THESE DRAWINGS. THE CONTRACTOR MAY ELECT TO USE ALTERNATIVE TECHNIQUES. SUCH TECHNIQUES MUST CONFORM TO THE DESIGN CRITERIA AND WILL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

3-8 LOAD COMBINATIONS - IN ACCORDANCE WITH AASHTO SPECIFICATIONS, EXCEPT THAT CREEP AND SHRINKAGE ARE CONSIDERED AS PART OF THE DEAD LOAD FOR ALL GROUP LOADINGS.

4 MATERIALS:

4-1 CONCRETE

4-1-1 CAST-IN-PLACE SUPERSTRUCTURE:
CLASS AX, F'c = 4000 PSI.
CLASS PC, F'c = AS NOTED IN PLANS

4-1-2 CAST-IN-PLACE SUBSTRUCTURE:
~~CLASS SC, F'c = 5500 PSI (PIERS 2, 3, 11 (15 COLUMNS ONLY)~~
~~CLASS AX, F'c = 4000 PSI (PIERS 4 THRU 13 COLUMNS & PILE CAPS AND~~
~~CLASS B, F'c = 3000 PSI (A15, F16,)~~ ~~ALL FOOTINGS EXCEPT PIER 15)~~
CLASS D, F'c = 3600 PSI (SEALS), SHALL BE USED FOR ALL SEALS ☆

4-1-3 PRECAST SKIRTS:
CLASS AX, F'c = 4000 PSI.

4-2 REINFORCING STEEL
ASTM A-615 GRADE 60, UNLESS OTHERWISE NOTED.

4-3 POST-TENSIONING STEEL

4-3-1 STRAND: GRADE 270, 0.6" DIAMETER.
(A) FRICTION COEFFICIENT: 0.25
(B) WOBBLE COEFFICIENT: .0015
(C) ANCHOR WEDGE SET: .375"
(D) MODULUS OF ELASTICITY: 26,500 KSI
(E) JACKING STRESS: 202.5 KSI (75% ULTIMATE)
(F) ANCHORING STRESS: 189.0 KSI AFTER ANCHOR SET (70% ULTIMATE)

4-3-2 BARS: ASTM A722 TYPE II INCLUDING SUPPLEMENTS S1, S2 AND S4 ⚠
(A) ULTIMATE STRENGTH: 150 KSI
(B) JACKING STRESS: SHOULD BE DETERMINED BASED ON ACCOMPLISHING 70% OF ULTIMATE AFTER ANCHOR SET, BUT IN NO CASE SHOULD IT EXCEED 75% OF ULTIMATE.

5 ALLOWABLE STRESSES:

5-1 CONCRETE IN SUPERSTRUCTURE

5-1-1 TEMPORARY STRESSES BEFORE LOSSES DUE TO CREEP AND SHRINKAGE. TEMPORARY STRESSES ARE CRITICAL AT THE TIME OF FORM STRIPPING, VERTICAL, TRANSVERSE AND LONGITUDINAL PRESTRESSING.
(A) COMPRESSION: 4000 PSI BEFORE STRESSING.

5-1-2 STRESSES AT SERVICE LEVEL AFTER ALL LOSSES HAVE OCCURRED.
(A) COMPRESSION: 40% F'c (2200 PSI)
(B) TENSION IN DECK WITH BONDED REINFORCING: $3\sqrt{F'c}$ (222 PSI)

5-1-3 ANCHORAGE BEARING STRESSES.
(A) AT TRANSFER OF LOAD:
$$FCP = 0.8\ F'c \sqrt{\frac{A'_B}{A_B}} - 0.2 \geq 1.25\ F'c_i$$
(B) AT SERVICE LOAD:
$$FCP = 0.6\ F'c \sqrt{\frac{A'_B}{A_B}} \geq 1.25\ F'c$$
THE MANUFACTURER OF THE POST-TENSIONING ANCHORAGES SHALL PROVIDE CERTIFICATION THAT THE ANCHORAGES WILL MEET THESE REQUIREMENTS IN ADDITION TO THE NORMAL PROVISIONS OF THE WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION AND AASHTO.

5-2 FOUNDATION ELEMENTS

5-2-1 ALLOWABLE LOAD AT SERVICE LEVEL FOR STEEL CYLINDER PILES:
(A) MAXIMUM LOAD = 1000 KIPS
(B) MINIMUM LOAD = 400 KIPS (TENSION)

5-2-2 ALLOWABLE LOAD AT ULTIMATE LEVEL FOR STEEL CYLINDER PILES:
(A) MAXIMUM LOAD = 2500 KIPS
(B) MINIMUM LOAD = 1000 KIPS (TENSION)

6 CONSTRUCTION PRACTICES:

6-1-1 TRANSVERSE AND VERTICAL TENDONS MAY BE FULLY STRESSED AFTER A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IS ATTAINED. (4000 PSI CAN BE OBTAINED IN APPROXIMATELY 20 HOURS WITH THE USE OF TYPE III CEMENT COMBINED WITH FLY ASH AND SUPERPLASTICIZERS.)

6-1-2 LONGITUDINAL CANTILEVER TENDONS MAY BE FULLY STRESSED WHEN THE COMPRESSIVE STRENGTH OF THE CONCRETE REACHES 4000 PSI AND BEFORE STRIPPING OF THE FORMS AND ADVANCEMENT OF THE TRAVELERS.

6-1-3 LONGITUDINAL OR TRANSVERSE CLOSURE STRIPS SHALL ATTAIN A MINIMUM STRENGTH OF 4,000 PSI BEFORE POST-TENSIONING, UNLESS THE ANALYSIS REQUIRES A HIGHER VALUE.

7 SLAB THICKNESS

7-1-1 ALL TOP SLAB DIMENSIONS AND ALL ELEVATIONS ARE BASED ON FINAL TOP SLAB THICKNESS AFTER 1/4" SCARIFYING. THEREFORE THE TOP SLAB MUST BE CONSTRUCTED 1/4" THICKER THAN PLAN DIMENSIONS SHOWN. THE THICKER SLAB IS THEN SCARIFIED 1/4" BEFORE ADDING 1 1/2" OVERLAY.

NOTE:
☆ CHANGE ORDER NO. 7 REVISED SEGMENT LENGTH FROM 14.25 TO 171 CHANGING MANY DIMENSIONS, ELEVATIONS & DETAILS KEYED TO SEGMENT LENGTH. SEE ADDED PLAN SHEETS.

☆ AS BUILT CHANGES 5-11-90

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Bridge Design Engineer | | | | | REGION NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS | Figg and Muller Engineers, Inc. Tallahassee, FL./Alexandria, VA./Denver, CO. -/Austin, TX./ Paris, France | Washington State Department of Transportation | SR 90 3RD LAKE WASHINGTON FLOATING BR. APPROACHES AND TRANSITION SPANS ALTERNATE A2 | F2 |
| Supervisor | | | | | 10 | WASH | I-90-1(242) | | | | | | |
| Reviewed By | | | | | JOB NUMBER | | | | | | | | |
| Designed By | | | | | 84W107 | | | | | | | | |
| Checked By | | | | | CONTRACT NO. | | | | | | | | |
| Detailed By | 12-84 | Editorial changes | CEN | MR | 2833 | | | | | | | GENERAL DESIGN NOTES | SHEET 277 OF 579 SHEETS |
| Architect | 11-16-89 | ⚠ Added note | CEN | CMR | | | | | | | | | |
| Preliminary Plan By | DATE | REVISION | BY | APP'D | | | | | | | | | |

Clyde L. Slemmer, Registered Professional Engineer, Feb. 6, 1981, APPROVED

DOT FORM 221-012 Revised 9/82

SR 90/540